

DOCUMENT RESUME

ED 347 964

IR 014 210

AUTHOR Rekkedal, Torstein
TITLE The Telephone as a Medium for Instruction and Guidance in Distance Education. Report from an Experiment at NKI, Norway.
INSTITUTION NKI-Skolen Undervisningssentrum, Bekkestau (Norway). Research and Development Dept.; Norwegian Association for Distance Education.
SPONS AGENCY Royal Ministry of Church and Education, Oslo (Norway).
REPORT NO ISBN-82-562-2241-7
PUB DATE 89
NOTE 58p.
AVAILABLE FROM NKI, Box 111, N-1341 Bekkestua, Norway.
PUB TYPE Reports - Research/Technical (143) -- Tests/Evaluation Instruments (160)
LANGUAGE English; Norwegian
EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Adult Vocational Education; *Distance Education; Foreign Countries; Intermode Differences; Interviews; Postsecondary Education; Questionnaires; Student Attitudes; Teacher Attitudes; Teaching Methods; *Telephone Communications Systems; *Tutoring

ABSTRACT

A study was performed to evaluate the effects of tutor initiated telephone communication on students' course completion rates and their quantitative achievements in the Norwegian NKI distance education program. Secondary goals of the project were to assess other consequences of teletutoring, such as organization, costs, and student and tutor attitudes. The study took place during one year and consisted of an experiment supplemented by a student questionnaire and tutor interviews. Study participants were 186 students divided randomly into one experimental and two control groups. Experimental group members were called by their tutors at least once during the study or more often if deemed necessary. They were also invited to place calls to their tutors. The first control group was assigned the same tutors as the experimental group, and the second control group was assigned tutors unaware of the project. Control group members were neither called nor invited to call their tutors. Results from the experiment seem to indicate that students who received tutoring by telephone achieved better results and had higher course completion rates. Questionnaires showed students to be reasonably satisfied with the opportunity for teletutoring, and tutors reported increased motivation during the program. It is also concluded that teletutoring need not imply large increases in program costs. Data are presented in 17 tables. A summary of the project and copies of the questionnaires, all in Norwegian, are appended. (26 references) (NRP)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *

ED347964

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

* This document has been reproduced as
received from the person or organization
originating it.

□ Minor changes have been made to improve
reproduction quality.

• Points of view or opinions stated in this docu-
ment do not necessarily represent official
OERI position or policy.

Torstein Rekkedal

The Telephone as a Medium for Instruction and Guidance in Distance Education

Report from an experiment at NKI, Norway



"PERMISSION TO REPRODUCE THIS
MATERIAL HAS BEEN GRANTED BY
Torstein Rekkedal

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)."

SEFU
Norwegian Centre
for Distance Education

NKI

TR014210

Torstein Rekkedal

The Telephone as a Medium for Instruction and Guidance in Distance Education

Report from an experiment at NKI, Norway

Project: The NADE Media and Technology Project
Organized by: Norwegian Association for Distance Education

Research reports from NKI

1. Korrespondansestudier. Rekruttering, prestasjon og frafall. 1972.
2. Correspondence Studies. Recruitment, achievement and discontinuation. 1972.
3. Systematisk elevoppfølging. En eksperimentell undersøkelse av virkningen av kontaktbrev til elever ved NKI-skolen. English summary. 1972.
4. Tre årskull brevskoleelever. English summary: Three years' enrolments to NKI-skolen's correspondence courses. 1973.
5. Innsendingsoppgavene i brevundervisningen. English summary: The Written Assignments in Correspondence Education. Effects of reducing turn-round time. 1973.
6. Begynneroppfølging av brevskoleelever. English summary: Follow-up of correspondence students. 1975.
7. Tekniske studier: Korrespondanseundervisning og klasseundervisning. Delrapport 1: Rekruttering. English summary. 1976.
8. Tekniske studier: Korrespondanseundervisning og klasseundervisning. Delrapport 2: Brevskoleelevene. 1987.
9. Studier ved NKI's tekniske skole. Delrapport 3 fra prosjektet "Tekniske studier - Brevundervisning og klasseundervisning." English summary. 1979.
10. Introducing the personal tutor/counsellor in the system of distance education. Project report 1. Experiment description. 1981.
11. Introducing the personal tutor/counsellor in the system of distance education. Project report 2. Final report. 1985.
12. The Telephone as a Medium for Instruction and Guidance in Distance Education. NKI/SEFU. 1989

Research and Development Department
NKI
P.O. Box 111
N - 1341 Bekkestua
Norway

SUMMARY

Author:	Torstein Rekkedal
Title:	The Telephone as a Medium for Instruction and Guidance in Distance Education
Main project:	Norwegian Association for Distance Education The Media and Technology Project
Source of finance:	NKI The Ministry of Church and Education

The report covers background, design and results from an experiment on the use of telephone by part time tutors in distance study for guidance and tutoring purposes.

The results indicate that the experimental group students, who have been offered tutor initiated telephone calls and a possibility to phone their tutors, achieve better results than the control group who was not offered this service.

Generally, the differences between the groups were not statistically significant.

Questionnaire answers indicate that distance students are positive towards telephone tutoring as part of the distance teaching system.

Interviews with the part time tutors indicate that they may accept telephone tutoring as part of their work responsibilities.

Key words: Distance teaching, teletutoring

Contents	Page
SUMMARY	3
1 INTRODUCTION	7
2 THE TELEPHONE AS A MEDIUM IN DISTANCE EDUCATION	8
3 THE NKI PERSONAL TUTOR/COUNSELLOR PROJECT	11
4 THE NKS TELEPHONE PROJECT	13
5 PROBLEMS TO BE INVESTIGATED	14
6 RESEARCH DESIGN AND PROCEDURES	15
6.1 The courses and the selection of students	15
6.2 Research design	16
6.3 The experimental variable	16
6.4 Questionnaire and data collection	17
6.5 Statistics/data processing	17
7 SUMMARY OF RESULTS	18
8 MEASURES OF STUDY SUCCESS	20
8.1 Non-start and completions	20
8.2 Pace of study	23
8.3 Course statistics conclusions	23
9 DATA COLLECTED THROUGH THE QUESTIONNAIRE	24
9.1 The actual use of telephone communication	24
9.2 Felt need for telephone contact and access	26
9.3 Teletutoring as a means of reducing feelings of isolation	28
9.4 Preference of communication means in student/tutor contact	29
9.5 Attitudes toward tutor initiated telephone calls	30
9.6 Attitudes towards teletutoring among students who have experienced tutor contact via telephone	30
9.7 The students who never had telephone contacts with their tutors	33
9.8 Some open statements	34
9.9 Summary and conclusions of information from the questionnaire	35
10 THE TUTORS' REGISTRATIONS, EXPERIENCES AND COSTS	37
11 CONCLUSIONS AND RECOMMENDATIONS	39

BRUK AV TELEFON SOM MEDIUM I INDIVIDUELL FJERNUNDERVISNING		
SAMMENDRAG		40
1	Telefonundervisning	40
2	Gjennomføring av forsøket	40
3	Resultater	41
4	Resultater fra spørreskjemaundersøkelsen	41
5	Informasjoner fra lærerne	42
6	Kostnader	43
7	Konklusjoner og anbefalinger	44
BIBLIOGRAPHY		44
Appendix 1. Questionnaire for the E-group		47
Appendix 2. Questionnaire for the C-groups		53

1 INTRODUCTION

The research study was carried out as one of the sub projects within the NADE (Norwegian Association for Distance Education) Media and Technology Project.

The NADE project was primarily established as an inter-institutional development programme for its member institutions and their staff. The main goal was to develop competence and increase experience in the use of technological media. When the project was started there was a general agreement that relatively simple and well known media, such as the telephone and audio cassettes, were just as interesting as the newer media and technology, such as video, interactive video, satellites and computer mediated communication. Consequently, experiments with audio cassettes and telephone were given a high priority by the steering committee. At the same time, the use of satellite for video presentation, computer conferencing and pilot experiments with interactive video have partly been included in the cooperative project. Or they have been carried out by the participating institutions with reports to the project and participants (e.g. Paulsen & Rekkedal 1988, Blom & Kristiansen 1988, Blom et. al. 1988).

Two main sub projects on the use of telephone in distance education have been carried out as part of the NADE media and technology project. This report describes the NKI project. A short overview of the NKS project is given in chapter 4.

This research project has been highly influenced by ideas and suggestions from participants in the NADE project, especially my colleagues at NKI, Svein Qvist-Eriksen and Knut Finsen, who also surveyed the practical conditions of the experiment.

I am specifically grateful to the tutors who took part in the experiment, Hans Gangmark, Asbjørn Hagerupsen, Liv Skaare and Ivar Stabenfeldt.

Thanks also to my colleagues, Anne Ma Tellefsen and Magda Færøyvik, who have been to great help in advising me on my English.

Without help from my son, Magnus, who coded and installed the data for processing, this report would have taken an even longer time to complete.

In spite of the support received from my colleagues during the research, the final result as presented here, is my responsibility.

2 THE TELEPHONE AS A MEDIUM IN DISTANCE EDUCATION

No doubt the ordinary telephone may be a useful means of communication in distance education. According to the literature, it has been applied for educational purposes since 1939 (e.g. Moore 1981, Thompson 1984). Examples from the research literature include an early experiment at Hermods in Sweden (Ahlm 1972) and the work of Flinck in connection with the European Home Study Council (EHSC) project "Two-way communication in correspondence education".

Flinck mentions four ways of using the telephone in distance education:

Teleteaching, which is operated by a two-way loudspeaking telephone in the classroom, and students not present may listen to the verbal activities going on in the classroom and also participate in the discussions.

Telelecture, also operated by a two-way transmitter. The teacher may give a lecture to individuals or groups located at a distance. Two way communication is possible for all participants.

Dial access is an information service rather than a teaching/learning system. The system provides the students with brief information on specific topics.

Teletutoring is a system where an individual student can communicate with the tutor and receive individual help and support during his studies (Flinck 1978).

Robinson (1981) gives an overview of the use of telephone tutoring at the British OU. According to her account the OU applies three kinds of telephone tutorials, (1) home based conference calls linking up to seven students with a tutor, (2) study centre based calls, linking students at one or more study centres with a tutor, and (3) one-to-one student-tutor calls.

Differently from Flinck, most writers seem to use the concept tutoring for both one-to-one tutor-student communication and tutor-group(s) communication.

It seems clear that the concept teleteaching also should include activities based on telephone conferencing where a number of individual students and one or more teachers are connected at the same time. The University of Wisconsin, USA, has for many years been a leading institution in teleteaching applications. Thompson (1984) gives an overview of teleteaching carried out by the

University of Wisconsin and the development of the University's Educational Telephone Network (ETN). Meakin (1978) describes how teleconferencing systems may be used for group tutorial purposes in higher distance education with examples from the British Open University. Grimwade (1984a, 1984b) has described similar practical trials of teleconferencing at Deakin University.

A special application of telephone conferencing is described by Perinchief and Hugdahl (1982) where the Wisconsin ETN was used for teaching music. The evaluation results are described very favourably by the authors who conclude that "telephone teaching can greatly enrich learning at all levels..." (Perinchief & Hugdahl 1983, p.35).

Telephone conferencing may also be applied for group learning activities without teacher participation. Group activities for learning based on telephone conferencing are, in our view, not directly included in any of the forms mentioned by Flinck.

Teletutoring (in Flinck's terminology) is of special interest in connection with individual distance learning as organised in our context. A number of distance learning institutions apply this method in different forms. In general, it seems that the possibility of direct contact with the tutor via telephone is seen as motivating and helpful in the learning process of the individual student (Flinck 1978, Burge 1984). This point is also stressed by Cochran and Meech (1982), who presents a training scheme for teletutors developed at Athabasca University.

A survey of tutors' and students' views on telephone applications in distance education, reported by Potter (1983), shows that the students give individual telephone tutoring a high priority. While teleconferencing is highly preferred by the tutors, only a small minority of the students supported the use of teleconferencing in distance study.

Bååth (1979) has analysed which educational functions the telephone may have in distance education. Bååth's analysis is carried out in relation to different theoretical models for teaching. We shall shortly quote some of Bååth's conclusions:

- The greatest potential value of telephone contacts seems to lie in the opportunities to establish individualised contact
- Telephone tutoring could help the tutor to get to know the individual student
- Telephone tutoring could, above all, help the student to get started

- With regard to cognitive learning goals, individual guidance over the telephone would appear to be valuable as a medium for fulfilling the following Gagné teaching functions:
 - activating motivation
 - directing attention
 - stimulating recall of relevant prerequisites
 - providing learning guidance
 - providing feedback

(Bááth 1979).

Moore (1981) seems to agree with Bááth that telephone teaching has a large potential in distance education. According to Moore:

- "- Like correspondence education, radio, television, computers and print, the telephone provides opportunities for formal learning at a place convenient to the learner.
- ...like other distance teaching media, the telephone can disseminate teaching by rare or scarce authorities over a wide area.
- The telephone differs from the other media in being more highly interactive, and therefore permitting a lesser degree of structure by the instructor....
- An especially valuable characteristic of educational telephone is the potential of meeting highly specialized needs, and in this it can be contrasted with broadcasting.
- ... the telephone has the characteristic of "immediacy".

And finally in considering "why the telephone?", it appears from the experience, and from research, that the telephone is effective in achieving learning, not only of information, but of problem solving, of new values, even psychomotor skills." (Moore 1981, p.26-27).

3 THE NKI PERSONAL TUTOR/COUNSELLOR PROJECT

For a number of years NKI has carried out a sequence of research and development projects with the general aims of stimulating high quality learning and increasing completion rates in distance education. Developing strong support systems for distance learners has been the underlying main goal for the majority of these projects.

The previous project, "Introducing the personal tutor/counsellor in distance education" (Rekkedal 1985) constituted an effort to integrate tutoring and counselling functions within the work of one specific tutor, who taught, guided and followed up the student during the starting period of a study programme. In this project 10 different aspects of the tutor's work were systematically manipulated. Study results and student attitudes were measured. The experiment gave significantly better results for the experimental group. We had deliberately chosen to experiment with a number of variables to create a completely different teaching/learning system. Consequently, we were in no position to detect the direct influence of the individual variables, e.g. we could not find specifically the contribution played by the telephone in increasing completion rates relative to other elements of the teaching system.

During the experiment, the tutor phoned all experimental students that he could reach by telephone. The calls were done in connection with a follow up scheme during the initial period of study, or on following up inactive students, or for feedback, guidance and instruction in connection with the return of assignments. The students were also strongly advised to call their tutor if they felt the need to do so.

Some few conclusions may be drawn from this experiment:

Telephone tutoring does not have to cost very much (even with the relatively high cost of teleservices in Norway), at least not if the tutor is attentive to the time element for tutor initiated calls.

In answering whether telephone tutoring was to any help in their distance study course, the experimental students expressed the following:

To a great extent	54%
To a certain extent	38%
Don't know	5%
Probably not	3%
Definitely not	0%

On a question on whether telephone tutoring reduces the possible feeling of isolation, the experimental students answered:

Yes, definitely	47%
To a certain extent	37%
Don't know	10%
Probably not	6%
Definitely not	1%

It should also be mentioned, that the control students, who had not experienced telephone tutoring, also expressed positive attitudes towards the potential of telephone contacts for distance learning.

In our group 43% of the students called their tutor at least once. In accordance with information from other projects, it seems that at least one tutor initiated call is necessary in order to involve a large number of students in a teletutoring system.

4 THE NKS TELEPHONE PROJECT

The NKI and NKS telephone projects were planned and carried out in cooperation. The common objective was to carry out different pilot projects to get relevant information on:

- how a telephone support and tutoring system might be organised as a standard element in our distance learning systems
- what costs would be involved
- what the benefits for the students would be
- what changes in tutor attitudes and roles would be necessary

The NKS project has till now (November 1988) been organised in three stages:

During the first stage, the students enrolled in three different single courses were asked whether they would accept to take part in a telephone supported group. Those who accepted were assigned to an "experimental" group, those who declined the offer constituted the "control" group. Students not informed about the teletutoring offer constituted a third group. It should be noted that since the students were selected to the groups in this way, the possibility of comparing results and attitudes as an effect of the treatment variable - teletutoring - is not possible.

The results showed that the group receiving a monthly telephone call from their tutor had higher completion rates than the other groups. The most probable conclusion would be that the students who wanted to take part in the telephone activities, i.e. accepting a deeper involvement with their tutors, from the very beginning were the most motivated students.

During the second stage, the NKS students were selected at random to an experimental and a control group. The number of telephone calls was reduced from one each month to four during the whole course. The preliminary results from the experiment do not show significant differences between the groups.

During the third stage, the tutor initiatives in contacting the students, have been further reduced. The tutor only takes the initiative to the first call. Afterwards it is up to the student whether he/she will call the tutor. Each tutor has a specific time when he/she may be reached by phone (Blom 1986, Blom et. al. 1988). During this third stage, NKS is also doing some pilot try outs of teleconferencing applications, such as the "theme line" where students at specific times may call and meet their tutor and fellow students on the line, or the "exam conference", set up as a formal telephone conference before an examination.

5 PROBLEMS TO BE INVESTIGATED

Results from the NKI Personal Tutor/Counsellor project indicated that the use of telephone to communicate between tutor and students for tutoring, counselling and guidance purposes was one of the reasons for the positive study results among the experimental students. NKI wanted to gain further experience on the effects of telephone tutoring, and examine the students' attitudes to the telephone as a medium in distance learning.

Furthermore, it was of specific interest to see how the use of telephone could be organised as a standard part of the external tutors' work. What costs would be involved? How would teletutoring affect the tutors' work situation and attitudes to distance tutoring?

To evaluate the effects of telephone tutoring on study efficiency variables, the project was designed as an experiment involving experimental and control groups. In addition, the students' attitudes were examined by means of questionnaires. The 4 tutors were informally interviewed on two occasions - two months after starting the experience and just after the completion of the experiment. The tutors noted all telephone calls and the length and content of the conversation.

As a result of the experiment we hoped to find some answers to the following questions:

1. Will the introduction of tutor initiated telephone communication with individual distance learners increase the completion rate and quantitative achievements of the students?
2. What are students' attitudes towards tutor initiated teletutoring and the possibility for the students to reach the tutor by phone?
3. How would the tutors evaluate the effect of telephone tutoring on their general work situation and work satisfaction?
4. What costs are involved in teletutoring as organised in this experiment?

6 RESEARCH DESIGN AND PROCEDURES

6.1 The courses and the selection of students

Most NKI distance learning programmes consist of a composition of single courses leading to a final exam and formal qualification. The course chosen for this experiment on the effects of introducing telephone tutoring, was a 5 course programme in transportation law and economy. Successful completion of the course and passed examination is required to receive public permission to run a business within the truck transport sector in Norway.

Statistics for the programme have for some years shown that a considerable number of enrollees do not start their studies. While the non-start rate in the majority of NKI course programmes is between 10 and 15 percent, the non start rate in this programme has been around 30 percent. On the other hand, the completion rate among those who start, has been reasonably high, i.e. over 70 percent. The completion rate among all registered students has been approximately 50 percent.

The experiment covered the first four courses of the programme:

- | | |
|--|----------------|
| 1. Lover og forskrifter for veitransportnæringen
Laws and Regulations for the Road Transport Sector | 3 study units |
| 2. Samferdsels- og reguleringsbestemmelser
Regulations for the Transport Sector | 3 study units |
| 3. Økonomi 1: Finansiering, regnskap og kalkyle
Economy 1: Financing, accounting and calculations | 7 study units |
| 4. Økonomi 2: Samfunns- og næringsmessige forhold
Economy 2: Society and business conditions | 4 study units |
| 5. Lastebilen og veien
The truck and the road (not included in the experiment) | |
| Total study included in the experiment | 17 study units |

New enrollees in the programme were selected for the experiment during the period from November 26th 1985 to January 29th 1986.

4 tutors were recruited for the experiment.

6.2 Research design

200 students were selected at random into one experimental group and two control groups, based on the last digit of their identification number. One of the control groups was tutored by the same tutors as the experimental group, while the second control group was assigned to other tutors. As we wanted a relatively larger experimental group, the students having last digits 0,3,7,9 were assigned to this group, while control group 1 consisted of students having last digits 1,4,7 and control group 2 last digits 2,5,8. As all distance students at NKI have the right to cancel their courses within 10 days free of charge, the total group included in the experiment was reduced to 186 students.

The design took this form:

E:	R	X1	O1
C1:	R	X2	O2
C2:	R	X3	O3

E=Experimental group

C1=Control group 1, taught by the same tutors as E

C2=Control group 2, taught by tutors not informed about the research project

R=Random selection into groups

X1=Experimental variable - tutor initiated teletutoring

X2=Treatment of the first control group

X3=Treatment of the second control group

O1, O2 and O3 measures of study success, rate of completion and student attitudes to telephone tutoring

In addition the project tried to assess other consequences of teletutoring, such as organisation, costs and tutor attitudes as a background for recommendations of introducing the teletutoring scheme in one form or another into the standard NKI distance learning system.

6.3 The experimental variable

The tutors taking part in the experiment followed these instructions:

1. All students in the experimental group shall be sent a printed presentation of their tutor together with their first assignments returned from the tutor, including a picture of the tutor and with specific announcement of the possibility of phoning the tutor. (The control students received similar presentations without this possibility mentioned.)
2. All students in the experimental group (who can be reached by telephone) shall be phoned by the teacher when the teacher has received the first assignment.

During the first call, the tutor:

- presented him/herself, welcomed the student and explained the advantages of using the telephone for communication in distance learning
 - might ask questions about the student, e.g. clear up lacking information on the student card and getting information for possible individualisation
 - answered questions from the student
 - tried to establish personal contact and motivate the student to phone whenever needed during the course
 - gave general advice on "how to study"
3. In addition, the tutors were instructed to call the students when the submitted assignments really proved that they had learning difficulties.
4. The tutors might also phone the students whenever they felt a phone call would be helpful.

6.4 Questionnaire and data collection

A questionnaire was developed in two different versions, one specifically for the experimental group and another for the control group. The questions included in the two forms were similar, but worded differently in light of the students' experiences with teletutoring. The questionnaire was enclosed with the final assignment returned from the tutor. Students who cancelled their courses, received the questionnaire together with the confirmation of their cancellation. The experimental period was one year, i.e. the students who had not completed their studies within one year from their individual enrollment date were categorised as non completers, and the number of assignments completed was registered. At the same time the questionnaire was sent to them. A reminder was sent to all students who had not returned the questionnaire within two weeks.

6.5 Statistics/data processing

The data collected from the experiment are considered to be of either nominal or ordinal scale types. In general, the criterion variables, such as the number of assignments completed, are divided into categories, preferably three, as recommended e.g. by Galtung (1967).

The data are tested for statistical significance, where we according to accepted conventions take differences below the probability of 5 percent to be statistically significant (Ferguson 1966).

We have chosen to apply Goodman-Kruskal's gamma (γ) to measure correlations between ordinal scale variables (Goodman & Kruskal 1954, 1963), while nominal scale variables are tested for statistical significance by chi-square calculations (Henrysson 1965). All data have been processed on a Compaq II PC applying the FOSS (File Oriented Statistical System) Programme Package (Amundsen 1986).

7 SUMMARY OF RESULTS

The data from the experiment have been collected by registration of study progress from student files, by a postal questionnaire, by registrations undertaken by the tutors and by interviews with the tutors taking part in the experiment.

In general, neither measures of study success nor measures of student attitudes showed statistically significant differences between the experimental and the control groups.

This means that it cannot be concluded from the experiment, that teletutoring - as carried out in this project - has an influence on student success and attitudes towards distance study.

The differences between the groups are in general within the limits of probability values and may be seen to have occurred by incidence. However, all tendencies in the material indicate that in the groups examined, the students who have received tutoring and guidance by telephone in addition to the written postal two-way communication with their tutors do achieve better results. The non-start rate among the experimental students is lower than among the control students, the completion rate is somewhat higher, and their answers to the questionnaire indicates that as a group they are reasonably satisfied with the possibility of telephone communication with the tutors during their distance study.

It should also be noted that approximately one half of the experimental group was for some reason never reached by telephone. This fact, of course, reduces the possible effects of the experimental variable relative to a situation where the experimental treatment is experienced by all members of the group.

All tendencies in the material indicate that telephone tutoring may have a positive effect in distance study. Our material has convinced us that NKI should further explore the application of telephone communication in distance study and different ways of organising telephone tutoring.

It seems that the use of telephone by external tutors may be arranged in a way that does not imply large increases in costs. As students in Norway pay relative to quantitative achievements, it may well be that the introduction of telephone tutoring improves the economy of the system, even if telephone tutoring is not based on extra charges.

The tutors taking part in the experiment unanimously agreed that telephone tutoring increased their motivation and work satisfaction. Repeatedly calling students who were not available, was seen as the major problem.

8 MEASURES OF STUDY SUCCESS

When examining the criterion variables of study success, we have chosen to look at differences between the experimental group and control group 1, and between the experimental group and control group 1 and 2 in combination.

By examining the difference between control group 1 and 2 we may see whether the personal factors of the participating tutors have influenced the results. We found only small and not statistically significant differences between the control groups. The control group taught by other tutors achieved somewhat better results measured by a number of course success variables. As control group 2 did a little better than control group 1, correlations between the experimental group and control group 1 gives higher correlations than when the two control groups are treated together, but as a result of the increased numbers, the latter correlations gives lower probability values.

In the following paragraphs we will present statistics for both situations.

8.1 Non-start and completions

The tendencies in the material for a number of different measures of start/non-start, show us that a higher percentage of the experimental students actually start to study their courses, defined by submitting their first assignment in at least one of the single courses. The difference is not statistically significant.

Table 1. Start and completions

	Experimental		Control 1		Control 2		Total	
	n	%	n	%	n	%	N	%
Non-start	17	23	18	33	18	32	53	28
1-6 units	10	13	11	20	8	14	29	16
7-16 units	11	15	7	13	4	7	22	12
Completed	37	49	19	34	26	47	82	44
Total	75	100	55	100	56	100	186	100

Statistics:

Start/non-start:

E*C1 E*(C1+C2)

r=.248

p=.183

4-divided variable:

E*C1 E*(C1+C2)

r=.250

p=.056

r=.188

p=.102

Compl./Non-compl.:

E*C1 E*(C1+C2)

r=.297

p=.075

r=.176

p=.224

We see that the non-start rate among the control students is similar to results from previous statistics, while the non-start rate among the experimental students is considerably lower.

The differences between the experimental group and control group 1 measured both by the 4-divided variable and by completion/non-completion are close to statistical significance. By all measures, the experimental group do better than control group 1.

As the students in principle may choose which course to study first, we registered the non-start rate for all 4 courses:

Table 2. Some statistics for the individual courses

	<u>Experimental</u> ‡	<u>Control 1</u> ‡	<u>Control 2</u> ‡	<u>Total</u> ‡
Course 1				
Non-start	36	49	41	41
1-2 units	5	4	4	5
Completed	59	47	55	54
Course 2				
Non-start	25	38	34	32
1-2 units	7	4	5	5
Completed	68	58	61	63
Course 3				
Non-start	29	55	41	40
1-6 units	15	9	11	11
Completed	56	36	48	49
Course 4				
Non-start	43	58	46	48
1-3 units	5	4	6	5
Completed	52	38	48	47
Statistics E*C1:				
Course 1: Completion/non-completion			$r=.226$	$p=.182$
Start/non-start			$r=.263$	$p=.118$
Course 2: Completion/non-completion			$r=.209$	$p=.233$
Start/non-start			$r=.291$	$p=.098$
Course 3: Completion/1-6units/non-completion			$r=.401$	$p=.003**$
Start/non-start			$r=.486$	$p<.001***$
Course 4: Completion/non-completion			$r=.274$	$p=.101$
Start/non-start			$r=.303$	$p=.064$

Because of small theoretical cell frequencies the only criterion variable which could be divided into 3 categories was "units completed" for course 3 (Economy 1 with 7 study units). It might be noted that we have here the only correlation which is statistically significant. As this course is the most difficult and largest course in the programme, the result may indicate that telephone tutoring is more important in connection with longer and/or more difficult courses.

In spite of the fact that no telephone calls were taken before the answers to the first study unit had been received by the tutor, the non-start rate is lower among the experimental students for all 4 courses. In fact, the number of non-starters seems to be the measure which shows the largest difference between the experimental group and the control groups.

(As the differences, except for one course, are not statistically significant, one should may be not emphasize these results too much. One could, however, speculate whether the lower non-start rate could be caused by the sheer feelings of comfort and support of having the possibility of telephone contact with the tutor during the studies. When the lower non-start rate in each individual course is concerned, we are more inclined to explain these results by student experiences during the other courses in the programme - as the students were quite free to decide the order of studying the courses.)

There is a clear tendency in the material showing that the majority of the students who start, really complete the individual course - and the total programme.

Table 3. Number of courses completed

	<u>Experimental</u>		<u>Control 1</u>		<u>Control 2</u>		<u>Total</u>	
	n	%	n	%	n	%	N	%
0 courses	22	29	22	40	22	39	66	35
1-3 courses	16	21	14	25	8	14	38	20
4 courses	37	49	19	35	26	46	82	44
Total	75	99	55	100	56	99	186	99

Statistics:

E*C1

r=.241

p=.084

E*(C1+C2)

r=.178

p=.144

It can clearly be seen that the experimental group performs better than control group 1 measured by the variable, "number of courses completed". The difference is not statistically significant.

8.2 Pace of study

Table 4. Pace of study - number of days to complete the programme (104 Non-completers are filtered out)

	Experimental		Control 1		Control 2		Total	
	n	%	n	%	n	%	N	%
Less than 88 days	14	38	6	32	7	27	27	33
89-145 days	13	35	5	26	10	38	28	34
146-360 days	10	27	8	42	9	35	27	33
Total	37	100	19	100	26	100	82	100
Statistics:	E*C1		E*(C1+C2)					
	r=.203		r=.197					
	p=.175		p=.255					

Students who have experienced teletutoring in this experiment spent less time in completing their courses. The differences are not statistically significant.

8.3 Course statistics conclusions

All data collected and statistics examined indicate that the experimental group which has been offered the possibility of communicating with their tutors by telephone, do better than the control group students. The experimental students show higher starting rates in the total course programme and in the individual single courses, they complete the full programme, as well as each individual course, in larger percentages than do the control group students. As a group, the experimental students complete their course in shorter time.

In general, the differences in the experiment are large enough to be considered theoretically interesting. However, the differences between the groups are not statistically significant. In this connection, it should be kept in mind that as many as 39 of the total group of 75 experimental students were never reached by phone by any of the participating tutors. This means that we are examining the effect of an experimental variable that probably has not affected all the experimental students.

Consequently, in our opinion the results found give good reason for further exploration of the effect of teletutoring on study success variables.

9 DATA COLLECTED THROUGH THE QUESTIONNAIRE

The questionnaire was produced in two versions. First, a number of questions had to be worded differently dependent on group belonging. Secondly, the experimental students were given some additional questions on the real experience of telephone communication.

The questionnaire was sent to all students immediately after completion. The questionnaire was also sent to students who had submitted at least one assignment, but not completed their study programme one year after enrolment. We found no reason to send the questionnaire to non-starters. Accordingly, 133 questionnaires were distributed together with a prepaid return envelope. A reminder was sent two weeks after. 88 usable questionnaires were returned (66%). The response rate was 72 percent in the experimental group and 61 percent in the control group. The difference may be explained by a higher interest in the questions among students who had experienced telephone communication. The response rate among completers was 78 percent and among non-completers 47 percent, a result probably to be explained mainly by the fact that a majority of non-completers received the questionnaire some time after actually dropping out from the course.

When processing the data from the questionnaire, we found no reason to separate the two control groups.

9.1 The actual use of telephone communication

NKI has for some time tried to motivate external tutors to invite their students to phone them during their studies. This means that theoretically the control students might have had the possibility of phoning their tutors, and the tutors in the control groups might also have phoned. The students in both the experimental group and the control groups were asked whether they had been phoned by their tutor(s) and whether they had phoned any of their tutors themselves.

Table 5. How many times have your tutor phoned you? (E)
Have any of your tutors phoned you? (C)

	<u>Experimental</u>		<u>Control</u>		<u>Total</u>	
	n	%	n	%	N	%
No calls	14	34	44	96	58	67
1 call	7	17	2	4	9	10
2 calls	10	24	0	0	10	12
3 calls	2	5	0	0	2	2
4 calls	8	20	0	0	8	9
Total	41	100	46	100	87	100

2 control students report that they have been phoned by their tutors, 1 from either of the two control groups. It should also be noted that as many as 14 of the experimental group respondents have never been reached by phone.

Table 6. Have you phoned any of your tutors? (E, C)

	<u>Experimental</u>		<u>Control</u>		<u>Total</u>	
	n	%	n	%	n	%
Yes	12	29	6	14	18	21
No	30	71	37	84	67	79
Total	42	100	43	100	85	100

Statistics: $E^*(C1+C2)$
 $r=.322$
 $p=.159$

According to the answers on the questionnaire there are, of course, relatively more students in the experimental group who have phoned their tutor. The difference is, however, not statistically significant.

For the experimental group we also had access to the tutors' registrations of phone calls. These registrations are given in Table 7.

Table 7. Phone calls established according to the tutors' registrations

Established telephone contact with	Students	
	n	%
None of the tutors	39	52
1 tutor	11	15
2 tutors	13	17
3 tutors	7	9
All 4 tutors	5	7
	75	100
Tutor spoken only with family member	4	
Students who phoned	12	

The table above does not say how many phone calls were actually carried out. A student who have had contact with only one tutor, may have had more than one telephone conversation. The tutors' registrations show that only 36 (48%) of the experimental group students actually had any telephone contact with their tutor. In the case of 4 students, telephone contact was established only with a family member. Only 12 students (16% of the total E-group) actually phoned 1 or more of the tutors. All the students who phoned, had been reached by one or more tutors by phone beforehand. It is worth noting that the percentage of students who phoned their tutors was considerably lower in this study than in our previous "Personal tutor/counsellor study" (Rekkedal 1985). This fact might be explained either by the closer relationship established by the tutor/counsellor through personal communication during a number of subsequent courses, or by possible differences between the courses in the two studies. We have some reason to believe that the courses included in this study do not stimulate close personal contact with the tutor to the same degree as the courses examined during our previous study.

9.2 Felt need for telephone contact and access

We asked the students in all groups whether they had felt the need to contact the tutor without actually doing it. In our opinion, the answers to this question by the experimental group would be of specific interest to us. The answers are given in Table 8.

Table 8. Have you felt a need to phone the tutor without actually doing it? If yes, what was the reason for not calling? (E,C)

	Experimental		Control		Total	
	n	%	n	%	N	%
Yes	3	7	14	30	17	19
No	39	93	32	70	71	81
Total	42	100	46	100	88	100

Statistics: $E^*(C1+C2)$
 $r = -.701$
 $p < .001***$

There is a marked and statistically significant difference between the groups concerning their answer to this question. We may conclude that the access to the tutor via the phone and the fact that the tutor stimulates and initiates telephone contact, results in very few students actually missing telephone contacts.

It seems clear that a large number of the control students (30%) experience an unsatisfied need for contact with their tutor. Consequently, we may conclude, that even though relatively few experimental students were reached by phone - and an even smaller number actually phoned themselves - those students who needed the teletutoring, seem to have taken advantage of the offer. The answers to the second question supports these conclusions:

Two E-students explained:

- "I managed to find the necessary information myself."
- "It was more convenient for me to call another student taking the same course."

Six control students explained that they could not phone because they did not have the tutor's phone number.

Five other control students explained:

- "I had som problems with "accounting", but did not really think of phoning, I rather tried to read more in the books."
- "I have contacted friends who study the same course when I have had problems."
- "I knew others in the business whom I could ask for advice."
- "I felt that it is difficult to phone the tutors at home in the evenings."
- "I did not have time during day time. During the evenings I would not at all bother the tutor."

From the answers we may read that some students manage to solve their problems themselves, they contact friends or relatives or other students. These explanations are known from a number of other research studies.

The two last explanations from the control students clearly show the situation also known from previous research (e.g. Flinck 1978). Many distance students are reluctant to contacting their tutors by phone, unless the tutor has taken the first initiative.

9.3 Teletutoring as a means of reducing feelings of isolation

All three groups were given an identical question on possible feelings of isolation.

Table 8. Have you felt isolated while taking this course? (E,C)

	<u>Experimental</u>		<u>Control</u>		<u>Total</u>	
	n	%	n	%	N	%
Yes, absolutely	0	0	1	2	1	1
Yes, somewhat	3	7	7	15	10	11
Don't know	3	7	0	0	3	3
No, not much	24	57	19	41	43	49
No, absolutely not	12	29	19	41	31	35
Total	42	100	46	99	88	99

Statistics: $E^*(C1+C2)$
 $r = -.116$
 $p = .689$

There is a tendency that the control group student to some extent express feelings of isolation. The difference between the groups is not statistically significant. The results confirm our earlier findings (Rekkedal 1985), that the distance students do not express strong feelings of isolation whether they have had the possibility of telephone tutoring or not.

Table 9. Do you believe that the possibility of telephone contacts with the tutor reduces possible feelings of isolation? (E,C)

	<u>Experimental</u>		<u>Control</u>		<u>Total</u>	
	n	%	n	%	N	%
Yes	25	60	29	64	54	62
Don't know	12	29	12	27	24	28
No	5	12	4	9	9	10
Total	42	101	45	100	87	100

Statistics: $E^*(C1+C2)$
 $r = -.105$
 $p = .599$

The students express a positive belief that the possibility of telephone tutoring may reduce feelings of isolation. It might be worth noting that there is a small tendency that the control group students, in fact, are more optimistic about telephone tutoring as a means for reducing feelings of isolation.

9.4 Preference of communication means in student/tutor contact

It is often mentioned that the time element involved in postal communication with the tutor in writing is a major problem in distance study. This is also one major factor when considering computer mediated communication as an important development to increase the quality of distance education. To our students in this research study, written communication means communication by postal letters.

Table 10. If you felt a need to contact your tutor during your studies, would you prefer to phone or write? (E,C)

	<u>Experimental</u>		<u>Control</u>		<u>Total</u>	
	n	%	n	%	N	%
Absolutely prefer to write	1	2	0	0	1	1
Preferably write	2	5	4	9	6	7
Don't know	1	2	3	7	4	5
Preferably phone	24	57	29	63	53	60
Absolutely prefer to phone	14	33	10	22	24	27
Total	42	99	46	101	88	100

Statistics: $E^*(C1+C2)$
 $r=.261$
 $p=.402$

We may conclude that the students in both groups prefer to contact their tutor by telephone rather than by writing. This preference is independent of their actual experience of telephone communication. Consequently, in spite of the fact that few students actually take advantage of the possibility of phoning their tutor, they clearly appreciate to have this service available.

9.5 Attitudes toward tutor initiated telephone calls

Table 11. What is your opinion about the tutors in this course taking the initiative to phone the students to give extra support? (E)
What would your opinion be about the tutors in the course taking the initiative to phone the students to give extra support? (C)

	Experimental		Control		Total	
	n	%	n	%	N	%
Very positive	18	44	13	29	31	36
Positive	21	51	25	56	46	54
Don't know	2	5	5	11	7	8
Negative	0	0	1	2	1	1
Very negative	0	0	1	2	1	1
Total	41	100	45	100	86	100

Statistics: $E*(C1+C2)$
 $r=.564$
 $p=.047*$

Generally, there are strong positive attitudes towards a service including the tutor initiating telephone communication with their students. The students who have received such an offer are more positive than those who have not had the offer. The difference is statistically significant. From the answers to this question we may conclude that the service tried out in this study has been positively accepted by the students.

9.6 Attitudes towards teletutoring among students who have experienced tutor contact via telephone

In addition to the questions asked all experimental students, the questionnaire contained some specific questions concerning the attitudes among the students who actually had experienced telephone contact with their tutor(s).

Table 12. Do you feel that it has been difficult to talk to your tutor on the phone?

	n	%
Very easy	12	43
Rather easy	14	50
Don't know	1	4
Rather difficult	1	4
Very difficult	0	0
Total	28	101

We may clearly conclude that the students do not look upon the telephone conversations as a difficult activity to take part in. The vast majority considers it as "very easy" or "rather easy" to talk with their tutor on the phone.

Table 13. The telephone conversations have made me feel that the tutors are interested in my study success.

	n	%
Agree completely	29	100
Partly agree	0	0
Don't know	0	0
Partly disagree	0	0
Disagree completely	0	0
Total	29	100

All respondents agree completely with the statement that the telephone conversations have made them feel that the tutors are interested in their study success. In our view, the answer to this question alone would be a strong argument for offering teletutoring to distance students.

Table 14. The telephone conversations have encouraged me during my studies.

	n	%
Agree completely	20	71
Partly agree	7	25
Don't know	1	4
Partly disagree	0	0
Disagree completely	0	0
Total	28	100

The students (nearly) unanimously agree with the statement that the telephone conversations have been encouraging.

Table 15. The telephone conversations have made me feel less isolated during my studies.

	n	%
Agree completely	14	48
Partly agree	9	31
Don't know	6	21
Partly disagree	0	0
Disagree completely	0	0
Total	29	100

One might say that the answers to this question are not as positive as the answers to the above questions, but still there is not one single student who disagrees with the statement.

The last statement in this series was on the effect of the telephone conversations in helping the student cope with difficulties. A similar question was put to the control students, but through an oversight the questions and answer alternatives turned out to be differently. Consequently, we have not found it advisable to calculate correlations and statistical differences.

Table 16. The telephone conversations have made it easier to cope with specific difficulties during the course. (E-group with telephone experience)
If you had the possibility of phoning your tutors, do you believe this would make it easier to cope with specific difficulties during the course? (C)

	Experimental			Control	
	n	%		n	%
Agree completely	14	52	Yes, Absolutely	11	24
Partly agree	8	30	Yes, probably	24	52
Don't know	5	18	Don't know	5	11
Partly disagree	0	0	No, probably not	5	11
Disagree completely	0	0	No, absolutely not	1	2
Total	27	100		46	100

The students who have experienced telephone contacts with their tutors, are very favourable towards the telephone as a means of coping with difficulties. If we consider the two ways of putting the question to the two groups as comparable, we might say that the students having had the experience are somewhat more positive than the control students (who haven't even had the possibility).

Generally, we may conclude from the answers from the students experienced with tele tutoring on the questions above that the students express clearly positive attitudes. They state that it has been easy to talk with their tutor(s) on the phone, that the conversations have made them feel that the tutors were interested in their study success, that they have been encouraged by telephone conversations, that the experience has made them feel less isolated, and that the telephone contacts have made it easier to cope with difficulties.

9.7 The students who never had telephone contacts with their tutors

In the questionnaire to the experimental students we put in a few questions to be answered by those students who had not taken advantage of the possibility to phone their tutors, and who were never reached by the tutors on the phone. Through these questions we hoped to find some explanations for the lack of telephone contacts.

Table 17. Survey of possible reasons for not having had any telephone contact with the tutor(s).

	Correct	Wrong	No answer	Total
I don't have access to a phone which may be used in my studies	2	9	2	13
I haven't given my phone number to the tutor	6	4	3	13
The tutor has tried to reach me without succeeding	0	9	4	13
I have felt the need to phone but it has been difficult for me really to do it	0	10	3	13
I have tried to phone the tutor without succeeding	0	10	3	13
I have not felt any need to phone my tutor	8	3	2	13

It seems clear that some students prefer not to give information that they may be reached by phone, as only 2 students state that they do not have access to a phone. 6 students say that they have not given their number. Statement three indicates that the students do not know that the tutors have tried to reach them. The last three statements clearly show that these students generally have not felt the need of telephone contacts.

9.8 Some open statements

At the end of the questionnaire the students were given the possibility of giving some open comments. These are presented below.

Statements from the E-group supportive of teletutoring:

1. The telephone contacts have made it one hundred percent possible to complete the course in a satisfying and simple way. These contacts solved problems which arose and problems which might arise. The tutors were excellent and very sympathetic. The telephone contacts were absolutely crucial, and the tutors have been first class!
2. The only thing to say is that the telephone contacts were absolutely "top". I didn't know and was very positively surprised when they called me.
3. A nice way to study!

Other statements from the E-group:

1. All the tutors were excellent in commenting on my answers.
2. I tried to phone the tutor, but was not successful in reaching him. I have received help from another tutor at NKI.
3. I have been unprepared when the tutors have called. It would have been better if times and dates had been given beforehand in writing, I believe.
4. I don't have my own telephone. I had given my parents' phone number. They live next door. I believe that the tutors have tried to phone me a couple of times.

Statements from the C-group which indicate positive attitudes towards the possibility of telephone contacts:

1. It is very important to contact the tutor immediately when problems arise. I have mainly felt the need to phone during evenings and week-ends (Author's comment: Maybe we are to understand that the student would not like to bother the tutor at these times. We have seen this in earlier comments why some C-students did not phone their tutors). I have phoned NKI during the daytime and have always been treated well and received answers - either directly or by NKI phoning me back.
2. I can clearly see the positive effect of the personal contacts which can be established through a telephone conversation.
3. In my opinion, it is very convenient to be able to phone the tutor when he has given his phone number. We also have the possibility of phoning the main office of NKI.
4. Telephone contacts would have increased the personal communication.

Other statements from the C-group

1. I think the course is good as it is now organised.
2. It has been to my satisfaction as it has been.
3. Telephone contact with the tutor is difficult for me because I don't have access to a phone.
4. The combination of the NKI distance teaching course and local face-to-face teaching (Authors comment: Informal local teaching - not organised by NKI) was absolutely "top".
5. I think that if I were to phone the tutor every time I met difficulties, I would have had to phone every day.

Generally, the open remarks from the E-group students support the view that the service of including telephone tutoring in the distance teaching system represents an increase in the quality of the course. Viewpoints from the C-group students who have not had the experience of telephone contact, seem to support this conclusion.

9.9 Summary and conclusions of information from the questionnaire

The number of telephone calls was registered by the tutors. This information was to some extent controlled by information given by the respondents of the questionnaire. From the answer to the question about the number of telephone contacts, it is clear that the experimental group respondents are not completely representative for their group. Of the respondents, 66 percent report that they have had telephone contact with at least one of their tutors, while only 48 percent of the total experimental group were reached by phone, according to the tutors' registrations.

It is anyway clear that during the experiment, in spite of successive trials, only approximately half of the students were reached by phone. Very few students actually phoned their tutor(s).

On the other hand, according to the students answers, very few experimental students express that they have felt a need to call without doing so, while this is the case for a large minority of the control group students (38%). Consequently, one might carefully conclude that telephone tutoring, as carried out in this experiment, satisfied the needs of the students.

When it comes to feelings of isolation, the control students express to some larger extent that they have experienced such feelings. Both groups express a great belief in the possibility of teletutoring of reducing possible feelings of isolation.

Both groups are also very positive to the tutors taking initiative to telephone contacts. It should also be noted that a very large majority of students in both groups say that they

would prefer to phone rather than write if they needed to contact the tutor. In the light of these answers, it might be seen as quite surprising that so few students actually phoned.

The students who actually experienced telephone contacts, report their experiences very favourably. They report that it has been easy to talk with their tutor on the phone, that they have had a feeling of the tutors being interested in their studies, that the telephone conversations have been encouraging, that the conversations have made them feel less isolated, and that the telephone conversations have made it easier to cope with difficulties.

Taking the answers to the questionnaire into account and looking at these answers in relation to the statistics on course success variables, we feel that we have good reason to work further on the challenge of finding how telephone tutoring can be organised in a pedagogically sound and cost effective way in distance education.

10 THE TUTORS' REGISTRATIONS, EXPERIENCES, AND COSTS

During the course the tutors registered all activities connected with the use of telephone. These registrations included the number of tutor initiated calls, the number of student initiated calls, the number of unsuccessful calls from the tutor where no one was reached, or where a family member or work colleague answered the phone.

The registrations also included the length of the telephone conversation and subjective recall of the content. The registration also characterizes the conversation as generally a subject related or a social conversation or both.

Once during the experimental period and at the end, informal interviews were carried out with the four participating tutors in a group setting.

The number of phone contacts actually established had not been a large burden for the tutors. Only 36 students were ever reached by phone during the one year period. As we have seen before, only 5 students had been reached by phone by all 4 tutors, 7 had been in contact with 3 of the tutors, 13 with 2 tutors and 11 students had had telephone conversation(s) with only 1 tutor.

The registrations also show that, with a few exceptions, very few students had more than one telephone conversation with the same tutor.

The tutors carried out a vast number of unsuccessful calls where no one took the phone or the phone was answered by a family member. The tutors unanimously stated that the only felt burden of the project was the work and planning involved in repeatedly trying to reach the students by phone.

In some few cases, the student phoned back after the tutor had spoken with a family member. We may only speculate whether it has had any influence on the student that the student is told by the spouse that the distance tutor has phoned, if no other telephone contacts are established.

The length of the phone calls varied from approximately 10 minutes to about 20 minutes. The length seemed to have some relation to the tutor involved (or may be the subject). One of the tutors generally registered the conversation to last for 20 minutes, while another generally registered 10 minutes. The registrations of the two other tutors varied more, from between 10 to 20 minutes with an average of around 15 minutes.

The content of the first tutor initiated phone call centered around general study questions as presented by the tutor. Some of these first contacts also included subject related content. Later conversations were generally more subject related.

What were the tutors' attitudes towards teletutoring as carried out in this experiment?

A main conclusion is that all four tutors expressed that the experience had been very stimulating. They agreed that the telephone conversations with the students had added a complete new dimension to their work as distance tutors. They found that the telephone conversations generally stimulated them in their work, probably helped them doing a better job and made the rest of their distance tutoring more interesting.

It seems clear that the teletutoring as carried out in this experiment added relatively small extra costs to the total costs of the distance teaching system. The tutors were paid a similar amount for a telephone conversation as for correction and commenting on one student assignment. As the number of phone calls was quite low and generally carried out during evening hours, the telecommunication costs were also quite small.

Our conclusion from the interviews with the tutors was that systematic teletutoring could well be included in the distance tuition service with only small increases in costs. As repeated unsuccessful calls to some students were seen as the major burden, the tutors stressed that, if telephone tutoring was to be implemented on a larger scale, students not reached by phone, should only get an extra reminder about the telephone tutoring enclosed with the return of the first assignment.

11 CONCLUSIONS AND RECOMMENDATIONS

Concerning measurable results on study success variables and course statistics we have found that the students who have received a systematic service of tutor initiated telephone support during their studies achieve better results than the distance students in the ordinary distance study scheme.

Answers to the questionnaire indicate that the experimental students generally have experienced tutor initiated calls and the possibility of telephone tutoring as a positive supplement in distance study. The students who have had telephone contact with their tutor(s) seem to be "enthusiastic" about their experiences.

The tutors generally express positive attitudes towards teletutoring, and also give their views on how this service may be organised in a way to make it less demanding on the tutors' time and a more stimulating part of their work.

In our opinion the results from this project is promising enough to justify further research and clearly open the possibility for teletutoring to be installed as a normal part of the NKI distance teaching system.

We recommend that teletutoring is tried out in other courses at NKI.

These try outs should be statistically examined with the aim of getting a firm basis for deciding the conditions to be satisfied for teletutoring to be accepted and taken advantage of by the students - and thus give better study results.

BRUK AV TELEFON SOM MEDIUM I INDIVIDUELL FJERNUNDERVISNING

SAMMENDRAG

1 Telefonundervisning

Denne rapporten beskriver gjennomføringen av og resultatene fra et forsøk ved NKI med systematisk bruk av telefon for veiledning og undervisning av brevskoleelever.

Forsøket er ett av flere delprosjekter i Norsk Forbund for Fjernundervisnings (NFF) "Media og teknologiprosjekt". Erfaringer både i Norge og internasjonalt viser at telefonen kan være et egnet medium i fjernundervisning. Mange har slike erfaringer, men det er gjennomført relativt få kontrollerte undersøkelser innen feltet.

Ved NKI ble telefonundervisning systematisk benyttet i forbindelse med prosjektet "Personlig lærer/rådgiver i brevundervisningen" (Rekkedal 1975). I denne undersøkelsen var telefonundervisning og oppfølging av brevskolelevne delelementer i en metodeundersøkelse med flere elementer. Vi hadde derfor ikke full kontroll over hvilken effekt som kunne tilskrives telefonundervisning som delelement i undersøkelsen. Likevel hadde vi inntrykk av at selve anvendelsen av telefon som medium i individuell fjernundervisning hadde stor positiv betydning. Vi ønsket derfor å gå videre i forsøk med telefonundervisning.

2 Gjennomføring av forsøket

Forsøket er blitt gjennomført som et eksperiment med en eksperimentalgruppe og to kontrollgrupper. Elevene er tilfeldig fordelt på gruppene. En kurssammensetning på 4 enkeltkurs inngikk i forsøket, der 4 lærere underviste på hvert sitt kurs. De samme 4 lærere underviste elevene i kontrollgruppe 1, mens andre lærere, som ikke kjente til forsøket, underviste elevene i kontrollgruppe 2.

Elever i eksperimentalgruppen fikk informasjon i "lærerrepresentasjonen" om at lærerne ville ringe til dem, og at elevene kunne ringe lærerne på oppgitt telefonnummer.

Lærernes instruksjon gikk ut på å ringe elevene i forbindelse med behandling av 1. besvarelse i enkeltkurset, når elevene hadde levert spesielt svake besvarelser og ellers ved behov.

I den første samtalen skulle læreren presentere seg selv, motivere for bruk av telefon, i det hele tatt forsøke å etablere en god kontakt med eleven. Ellers skulle læreren bringe samtalen inn på eventuelle praktiske problemer, faglige spørsmål eller andre forhold, avhengig av elevens besvarelse eller samtalen forevrig.

Datainnsamling ble foretatt ved systematisk registrering av studiedata (start/ikke-start, antall fullførte brev og kurs), gjennom spørreskjema til både eksperimental- og kontrollgrupper, ved lærernes registrering av telefonsamtaler og gjennom intervjuer med lærerne.

3 Resultater

Alle data som ble samlet inn og statistisk bearbeiding indikerte at eksperimentalgruppen, som hadde fått muligheten til å kommunisere med sine lærere gjennom telefon, gjorde det bedre enn kontrollgruppene. Elevene i eksperimentalgruppen viste høyere startprosent i totalsammensetningen og i de enkelte kursene. De fullførte hele sammensetningen og de enkelte kursene i større grad enn kontrollgruppeelevene. Eksperimentalgruppen hadde også en kortere fullføringstid.

Generelt konkluderte vi med at forskjellene er store nok til at de kan betraktes som teoretisk interessante. På den annen side var forskjellene mellom gruppene generelt innen grensene for statistisk sannsynlighet. Det vil altså si at de målte forskjeller ikke var større enn det som statistisk kan forventes å inntreffe som et resultat av tilfeldigheter.

I denne sammenheng bør det påpekes at mer enn halvparten av eksperimentalgruppen aldri oppnådde noen telefonkontakt med noen av lærerne. Det vil si at vi i virkeligheten undersøker effekten av en eksperimentalvariabel som ikke har hatt full effekt på alle medlemmene i eksperimentalgruppen. (Det er langt fra usannsynlig at selve muligheten for telefonkontakt kan ha hatt betydning for elevenes studiesituasjon, selv om muligheten aldri har vært benyttet.)

Vår konklusjon er derfor at de statiske forskjeller er store nok til å gjøre det interessant å gå videre med forsøk i andre kurs.

4 Resultater fra spørreskjemaundersøkelsen

Lærernes registreringer viste at mindre enn 50 prosent av elevene hadde hatt telefonkontakt med noen av lærerne i løpet av forsøket.

På den annen side er det svært få av eksperimentalelevene som uttrykker at de har hatt behov for å ringe uten at de har gjort det, mens et relativt stort antall i kontrollgruppene sier at de har opplevd denne situasjonen. Vi har derfor trukket en forsiktig konklusjon om at telefonundervisning, som gjennomført i dette forsøket, har tilfredsstilt elevenes følte behov for telefonkontakt med lærerne.

Når det gjelder følelse av isolasjon, er det noen flere kontrollgruppeelever enn eksperimentalelever som uttrykker at de har opplevd slike følelser. Begge grupper uttrykker stor tro på telefonundervisning som middel for å redusere eventuell opplevelse av å være isolert i brevstudiet.

Begge grupper er meget positive til at lærerne tar initiativ til telefonkontakt med elevene i løpet av studiet. En stor majoritet i begge grupper uttrykker at de vil foretrekke å ringe fremfor å skrive når det har behov for å kontakte læreren. I lys av disse svarene kan det være overraskende at så få elever ringte på eget initiativ i løpet av forsøket. Bare 16 prosent av eksperimentalelevene gjorde det.

Elevene som hadde opplevd telefonkontakt med sine brevkolelærere rapporterer meget positive opplevelser. De sier at det har vært lett å snakke med lærerne over telefon, at de har fått en følelse av at lærerne er interessert i studiene deres, at telefonsamtalene har vært oppmuntrende, at telefonsamtalene har ført til at de har følt seg mindre isolert, og at de har gjort det lettere å komme over spesielle vanskeligheter i studiene.

5 Informasjoner fra lærerne

Lærerne registrerte i løpet av kurset alle aktiviteter forbundet med telefonundervisningen. Registreringene omfattet antall lærerinitierte og elevinitierte samtaler, antall ubesvarte oppringninger, lengden på samtaler og innholdet. Registreringene karakteriserte også samtaler som fagrelaterte, relatert til praktiske forhold eller om de hadde et mer sosialt preg.

Mengden av oppnådde samtaler ble ikke noen stor byrde for lærerne. Bare 36 elever (48% av eksperimentalgruppen) ble noen gang nådd pr. telefon i løpet av forsøksperioden. Bare 5 elever hadde hatt telefonkontakt med alle 4 lærerne. Med få unntak hadde elevene bare en samtale med samme lærer - et resultat av at meget få elever ringte selv.

Lærerne gjennomførte et stort antall forsøk på å treffe elever som ikke var hjemme. Lærerne var samstemte om at den vesentlig byrde for dem i forsøket gjaldt nettopp dette forhold.

Lengden av gjennomførte telefonsamtaler varierte stort sett mellom 10 og 20 minutter.

Vår hovedkonklusjon på grunnlag av intervjuene med lærerne var at erfaringene med telefonundervisning hadde vært meget stimulerende. De var enige om at telefonundervisningen hadde gitt en ny og positiv dimensjon til deres arbeid som brevkolelærere.

6 Kostnader

Det synes klart at teleundervisning, som gjennomført i dette forsøket, objektivt sett førte til relativt små økte kostnader i det totale fjernundervisningssystemet.

Vår konklusjon etter intervjuene med lærerne var at telefonundervisning kan gjennomføres som del av et fjernundervisningssystem med relativt små økte kostnader. I denne sammenheng la lærerne vekt på at dersom telefonundervisning skulle gjennomføres i større skala, bør det normalt tas sikte på at elever som ikke nås ved første forsøk over telefon, får tilsendt en påminnelse om muligheten for telefonundervisning ved retur av første besvarelse, og at det ikke gjøres flere forsøk på å treffe eleven pr. telefon.

7 Konklusjoner og anbefalinger

Når det gjelder målbare resultater for studiefremgang, viste eksperimentet at elever som har fått et systematisk tilbud om lærerinitiert telefonundervisning, gjør det bedre enn elever som ikke har fått et slikt tilbud. Forskjellene mellom gruppene er generelt ikke statistisk signifikante.

Svarene på spørreskjemaet viser at elevene generelt har opplevd lærerinitierte samtaler og muligheten til å ringe brevkolelærerne som et positivt supplement i fjernundervisningstilbudet. Elevene som har hatt telefonkontakt med en eller flere lærere, beskriver sine opplevelser som meget positive.

Lærerne uttrykker også positive holdninger til teleundervisning. De gir synspunkter på hvordan tilbudet kan organiseres for at arbeidet skal bli overkommelig og stimulerende.

På tross av at registrerte resultater ikke viser statistisk signifikante forskjeller, mener vi at de er tilstrekkelig lovende til å rettferdiggjøre videre forsøk på feltet. Våre erfaringer åpner muligheten for at telefonundervisning bør bli integrert i NKI's normale fjernundervisningssystem.

Vi anbefaler at telefonundervisning gjennomført av deltidsengasjerte lærere prøves ut i andre kurs ved NKI.

Disse forsøkene bør følges opp med systematiske registreringer for at man skal kunne finne beslutningsunderlag for å avgjøre hvilke betingelser som må oppfylles for at telefonundervisning skal bli akseptert av elever og lærere - og gi bedre studieresultater.

BIBLIOGRAPHY

- Ahlm, M (1972): Telefonundervisning - knuten til korrespondensundervisning. Malme: Hermods Utvecklingsgrupp.
- Amundsen, A. (1988): Fil-Orientert-Statistikk-System. Halden: Halden Mikro A/S.
- Blom, D. & Krane, A. G. & Rekkedal, T.(1988): The NADE Media and Technology Project: New ways of supporting distance learners in Norway. In Sewart, D. & Daniel, J. S. (ed.), pp. 116-120.
- Blom, D. & Kristiansen, T. (1988): The Jevnaker project: two experiments with live interactive television. In Sewart, D. & Daniel, J. S. (ed.), pp. 112-115.
- Blom, D. (1986): Tutor-initiated telephone support for distance students at NKS. Epistolodidaktika, 1, 51-62.
- Burge, E. J. (1984): Adult learning principles and distance learning design: bridging some professional distances. Ed. Research 50, pp. 113-119.
- Bååth, J. A. (1979): Correspondence Education in the Light of a Number of Contemporary Teaching Models. Malme: LiberHermods
- Cochran, B. R. & Meech, A.: (1982): Training Telephone Tutors. In Daniel, J. A.: Learning at a Distance - A World Perspective.

- Daniel, J. S.,
Stroud, M. A. &
Thompson, J. R. (1982) Learning at a Distance - A World Perspective. Edmonton: Athabasca University.
- Ferguson, G. A.: (1966): Statistical Analysis in Psychology and Education. (2nd ed.), London: McGraw Hill.
- Flinck, R. (1978): Correspondence Education Combined with Systematic Telephone Tutoring. Malmö: Hermods.
- Galtung, J (1967): Theory and Methods of Social Research. Oslo: Universitetsforlaget.
- Goodman, L. A. &
Kruskal, S. (1954): Measures of association for cross-classifications. J. of Am. Stat. Ass., 49, pp 732-764.
- Goodman, L. A. &
Kruskal, S. (1963): Measures of association for cross-classifications III. Approximate sampling theory. J. of Am. Stat. Ass., 58, pp. 310-364.
- Grimwade, J. R. (1984a): A teletutorial trial at Deakin University. Open Campus 9, 26-44.
- Grimwade, J. R. (1984b): Issues in teletutoring. Open Campus 9, 45-62.
- Henrysson, S. (1965): Elementär statistik. Stockholm: Almqvist & Wiksell.
- Meakin, P. (1978): Teaching by telephone in East Anglia. Teaching at a Distance, 22, 20-25.
- Moore, M. (1981): Educational telephone networks. Teaching at a Distance, 19, 24-31.
- Paulsen, M. F. &
Rekkedal, T. (1988): Computer conferencing - a breakthrough in distance, or just another technological gadget? In Sewart, D. & Daniel, J. S. (ed), 362-365.
- Perinchief, R. &
Hugdahl, E. O. (1982): Teaching music by telephone. Teaching at a Distance, 22, 33-35-
- Potter, G. (1983): The potential use of the telephone as an instructional device in external studies. Distance Education, 4, 1, 95-107.

- Rekkedal, T. (1985): Introducing the Personal Tutor/Counsellor in the System of Distance Education. Oslo: NKI.
- Robinson, B. (1981): Telephone tutoring in the Open University. A review. Teaching at a distance, 20, 57-65.
- Sewart, D. & Daniel, J. R. (ed.)(1988): Developing Distance Education. Oslo: ICDE.
- Thompson, G. (1984): The development of the educational telephone network at the University of Wisconsin. ICDE Bulletin, 5, 47-52.

Appendix 1. Questionnaire for the E-group

Spørreskjema til elever på kurset "Løye for godstransport".

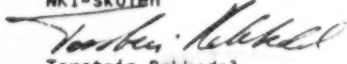
NKI-skolen gjennomfører med jevne mellomrom undersøkelser for å se hvordan undervisningen har fungert for den enkelte elev.

Dette spørreskjemaet tar spesielt opp bruk av telefon mellom elev og lærer i brevundervisningen. Noen av NKI's lærere oppgir telefonnummer, slik at elevene kan ringe dem. Noen ringer også til elevene i forbindelse med undervisningen.

Enten du har hatt telefonkontakt med læreren eller ikke, ber vi deg svare på skjemaet så nøyaktig som mulig. For at svarene skal bli representative er det viktig at alle svarer. Vi ber deg derfor bruke noen minutter på å fylle ut skjemaet og returnere det i den vedlagte konvolutten.

På forhånd takk.

Med vennlig hilsen
NKI-skolen


Torstein Rekkedal
Forskningsleder

Spørsmål 1

Er du blitt oppringt av noen av dine lærere i løpet av kurset?

Nei ☐

Ja ☐

Hvis ja, hvor mange av lærerne har ringt?

1

2

3

4

5

☐☐☐☐☐Spørsmål 2

I tilknytning til hvilket kurs er du blitt oppringt?

Er ikke blitt oppringt ☐

Samferdsel og reguleringsbestemmelser ☐

Finansiering, regnskap og kalkyler ☐

Lover og forskrifter for vegtransportnæringen ☐

Samfunns- og næringsmessige forhold ☐

Lastebilen og vegen ☐

Spørsmål 3

Til sammen hvor mange ganger er du blitt oppringt?

0

1

2

3

4

5

☐☐☐☐☐☐

6

7

8

9

10

Flere

☐☐☐☐☐☐Spørsmål 4

Har du ringt til en eller flere av dine lærere i løpet av kurset?

Ja ☐

Nei ☐

Hvis ja, hvor mange ganger har du ringt?

1

2

3

4

5

Flere

☐☐☐☐☐☐

Spørsmål 5

I tilknytning til hvilket kurs har du ringt læreren?

Har ikke ringt ☐

Samferdsel og reguleringsbestemmelser ☐

Finansiering, regnskap og kalkyler ☐

Lover og forskrifter for vegtransportnæringen ☐

Samfunns- og næringsmessige forhold ☐

Lastebilen og vegen ☐

Spørsmål 6

Har du hatt behov for å ringe læreren uten at du har gjort det?

Ja ☐

Nei ☐

Hvis du har svart ja, hva var grunnen?

Spørsmål 7

Har du følt deg isolert mens du har gjennomgått kurset?

Ja, absolutt ☐

Ja, litt ☐

Vet ikke ☐

Nei, ikke særlig ☐

Nei, absolutt ikke ☐

Spørsmål 8

Tror du at muligheter til telefonkontakt med lærer reduserer en eventuell følelse av isolasjon?

Ja ☐

Vet ikke ☐

Nei ☐

Spørsmål 9

Hva synes du om at lærere i dette kurset på eget initiativ prøver å ringe elevene for å gi ekstra støtte i studiet?

Svært positivt ☐

Positivt ☐

Vet ikke ☐

Negativt ☐

Svært negativt ☐

Spørsmål 10

Hvis du følte behov for å få kontakt med læreren i løpet av studiet, ville du da foretrekke å ringe eller å skrive?

Absolutt foretrekke å skrive ☐

Helst skrive ☐

Vet ikke ☐

Helst ringe ☐

Absolutt foretrekke å ringe ☐

Spørsmål 11

Muligheten til å snakke med lærerne over telefon i dette kurset har ikke vært inkludert i kursprisen. Ville du foretrekke at denne service var inkludert i brevundervisningen selv om kurset ville koste litt mer?

Ja, absolutt ☐

Ja, sannsynligvis ☐

Nei, sannsynligvis ikke ☐

Nei, absolutt ikke ☐

Spørsmål 12 (Besvares bare av de som ikke har hatt noen telefonkontakt med lærer.)

Svar på følgende utsagn ved å krysse av om utsagnet er riktig eller galt.

	Riktig	Galt
Jeg har ikke tilgang til telefon som jeg kan benytte i forbindelse med studiet.	☐	☐
Jeg har tilgang til telefon men har ikke oppgitt telefonnummer	☐	☐
Læreren har forsøkt å treffe meg, men jeg har ikke vært tilstede.	☐	☐
Jeg har følt behov for å ringe, men synes det har vært vanskelig å gjøre alvor av det.	☐	☐
Jeg har prøvd å ringe læreren, men har ikke fått kontakt.	☐	☐
Jeg har ikke følt noe behov for telefonkontakt med lærer.	☐	☐

Spørsmål 13 - 17 besvares bare av de som har hatt telefonkontakt med læreren.

Spørsmål 13

Synes du det har vært vanskelig å snakke med din brevskolelærer over telefon?

Svært vanskelig	☐
Litt vanskelig	☐
Vet ikke	☐
Temmelig lett	☐
Svært lett	☐

Spørsmål 14

Telefonsamtalene har gitt meg oppmuntring i studiet.

Helt enig	☐
Delvis enig	☐
Vet ikke	☐
Delvis uenig	☐
Helt uenig	☐

Spørsmål 15

Telefonsamtalene har fått meg til å føle at lærerne er interessert i hvordan det har gått med studiene mine.

- Helt enig ☐
- Delvis enig ☐
- Vet ikke ☐
- Delvis uenig ☐
- Helt uenig ☐

Spørsmål 16

Telefonsamtalene har fått meg til å føle meg mindre isolert i studiet.

- Helt enig ☐
- Delvis enig ☐
- Vet ikke ☐
- Delvis uenig ☐
- Helt uenig ☐

Spørsmål 17

Telefonsamtalene har gjort det lettere å komme over spesielle vanskeligheter i kurset

- Helt enig ☐
- Delvis enig ☐
- Vet ikke ☐
- Delvis uenig ☐
- Helt uenig ☐

Spørsmål 18

Har du andre ting du gjerne vil kommentere i forbindelse med bruk av telefon i brevundervisningen?

Mange takk for hjelpen.

Legg skjemaet i den frankerte konvolutten og returner den snarest.

Spørreskjema til elever på kurset "Løyve for godstransport".

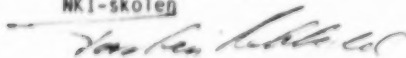
NKI-skolen gjennomfører med jevne mellomrom undersøkelser for å se hvordan undervisningen har fungert for den enkelte elev.

Dette spørreskjemaet tar spesielt opp bruk av telefon mellom elev og lærer i brevundervisningen. Noen av NKI's lærere oppgir telefonnummer, slik at elevene kan ringe dem. Noen ringer også til elevene i forbindelse med undervisningen.

Enten du har hatt telefonkontakt med læreren eller ikke, ber vi deg svare på skjemaet så nøyaktig som mulig. For at svarene skal bli representative er det viktig at alle svarer. Vi ber deg derfor bruke noen minutter på å fylle ut skjemaet og returnere det i den vedlagte konvolutten.

På forhånd takk.

Med vennlig hilsen
NKI-skolen



Torstein Rekkedal
Forskningsleder

Spørsmål 1

Har noen av dine lærere oppgitt telefonnummer, slik at du har hatt mulighet til å ringe læreren i løpet av kurset?

Ja ☐

Nei ☐

Spørsmål 2

Hvis ja, har du ringt til noen av dine lærere?

Ja ☐

Nei ☐

Spørsmål 3

Har noen av lærerne ringt deg?

Ja ☐

Nei ☐

Spørsmål 4

Har du hatt behov for å ringe læreren uten at du har gjort det?

Ja ☐

Nei ☐

Hvis du har svart ja, hva var grunnen?

Hadde ikke telefonnummeret ☐

Andre grunner ☐ Forklar

Spørsmål 5

Har du følt deg isolert mens du har gjennomgått kurset?

Ja, absolutt ☐

Ja, litt ☐

Vet ikke ☐

Nei, ikke særlig ☐

Nei, absolutt ikke ☐

Spørsmål 6

Tror du muligheter til telefonkontakt med lærer reduserer en eventuell følelse av isolasjon?

- Ja ☐
- Vet ikke ☐
- Nei ☐

Spørsmål 7

Hva ville du synes om at lærerne på eget initiativ prøve å ringe elevene for å gi ekstra støtte i studiet?

- Svært positivt ☐
- Positivt ☐
- Vet ikke ☐
- Negativt ☐
- Svært negativt ☐

Spørsmål 8

Hvis du følte behov for å få kontakt med læreren i løpet av studiet, ville du da foretrekke å ringe eller skrive?

- Absolutt foretrekke å skrive ☐
- Helst skrive ☐
- Vet ikke ☐
- Helst ringe ☐
- Absolutt foretrekke å ringe ☐

Spørsmål 9

Muligheten til å snakke med lærerne over telefon i løpet av studiet kunne bygges inn som et systematisk tilbud. Ville du foretrekke at en slik service var inkludert i brevundervisningen, selv om kurset ville kostet litt mer?

- Ja, absolutt ☐
- Ja, sannsynligvis ☐
- Nei, sannsynligvis ikke ☐
- Nei, absolutt ikke ☐

Spørsmål 10

Hvis du hadde hatt mulighet til å ringe dine lærere i løpet av kurset, tror du det hadde gjort det lettere for deg å komme over spesielle vanskeligheter?

- | | |
|-------------------------|--------------------------|
| Ja, absolutt | ☐ |
| Ja, sannsynligvis | ☐ |
| Vet ikke | ☐ |
| Nei, sannsynligvis ikke | ☐ |
| Nei, absolutt ikke | ☐ |

Spørsmål 11

Har du andre ting du gjerne vil kommentere i forbindelse med bruk av telefon i brevundervisningen?

Takk for hjelpen.

Legg skjemaet i den frankerte konvolutten og returner den snarest.

TR0601bh

 **NKI Forlaget**

ISBN 82-562-2241-7

GCS VEST HURTIGTRYKK